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(54) SWITCHING CIRCUIT FOR
DUPLEXING DETECTOR

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Specification

[Title of the Device]

SWITCHING CIRCUIT FOR DUPLEXING DETECTOR

[Claim for the Utility Model]

A switching circuit for duplexing a detector in an apparatus in which a detector is duplexed to perform OR stop and AND start, the switching circuit characterized in that an operation mode is switched to OR stop and OR start by a switch circuit only when the detector fails to prevent operation from being halted due to failure of the detector, thereby enabling a continuous operation.

[Detailed Description of the Device]

The present device relates to a switching circuit for duplexing a detector applied to all apparatus in which a detector is duplexed to perform OR stop and AND start.

Hitherto, when a detector is duplexed to perform AND stop, AND cannot be confirmed if the detector fails (the detector cannot output), so that an apparatus stops in that state. Thereafter, operation is returned to a manual mode to operate the apparatus, causing a great systematic loss in time to increase the failure probability of detectors in case of using a lot of detectors. This becomes an obstacle to system control.

The present device is for its purpose to enable a duplexed detector to continuously operate with the operation mode kept as it is even if the detector fails.

For example, if operation is stopped due to the failure of the detector while an object with a high temperature is being transported, a temperature is lowered during the stop to increase damage. Switching from automatic to manual mode to restart operation may exert influence on the operations of other installations (upstream and downstream) to cause a great total loss in time, so that a continuous operation without the change of the operation mode brings about a great effect.

One embodiment of the present device illustrated in the figure is described below. In the present device, duplexed detectors 1 and 2 disposed at a branch point where an apparatus moves are taken as an example and described. The move of the apparatus in the direction of the detector operates the detector 1 or 2, which is detected by the OR circuit 3 to stop the operation in the moving direction. In the next place, an AND circuit 4 detects the operation of the detectors

1 and 2 to confirm that the apparatus exists in that position and performs operation in the next direction (AND start). In this case, the failure of any one of the detectors 1 and 2 does not enable AND confirmation, failing to the following start. To prevent this, OR circuit 3', AND circuits 4a and 4b, and NOT circuits 5a and 5b perform the detection of failure of the detectors, that is, disagreement in synchronism, to turn on an indicator lamp 8. Throwing a switch 6 in this state turns on a relay 7 to close its contact point 7a and open its contact point 7b, thereby switching an operation to the OR circuit.

Throwing the switch 6 before the detectors 1 and 2 fail allows the switch 6 to be automatically switched when the detectors fail, alternatively, as described above, after the detectors 1 and 2 have failed (the system stops in that state), an operator may throw the switch 6 to restart, thus two distinctive usages are enabled.

The present device allows a continuous automatic operation without the stop of operating function of the apparatus even when the detector fails, which is effectively applicable to places where a system shall not be stopped and to the whole apparatus.

A circuit with OR stop and OR start set from the beginning malfunctions when the detector inversely fails (the detector continuously outputs), so that the circuit is set to OR stop and AND start when the detector normally operates and the circuit is changed to OR stop and OR start only when the detector fails, which brings about a safety effect. Furthermore, a failure place of the detector can be confirmed by lamp indication.

[Brief Description of the Drawing]

Figure is a circuit diagram illustrating one embodiment of the present device.

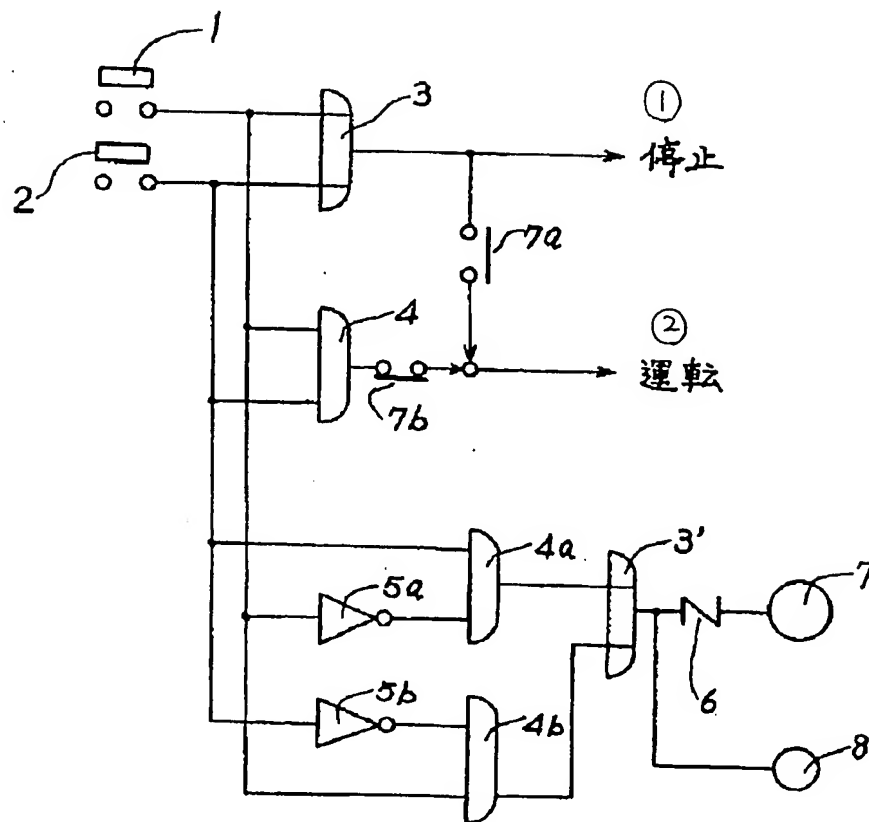
- 1 and 2 ... Detector
- 3 ... OR circuit
- 4 ... AND circuit
- 5 ... Inverter
- 6 ... Switch
- 7 ... Switching relay
- 8 ... Indicator lamp.

Figure

#1 STOP

#2 OPERATION

Drawing of Reference 1 with handwritten reference numbers



5

実用

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